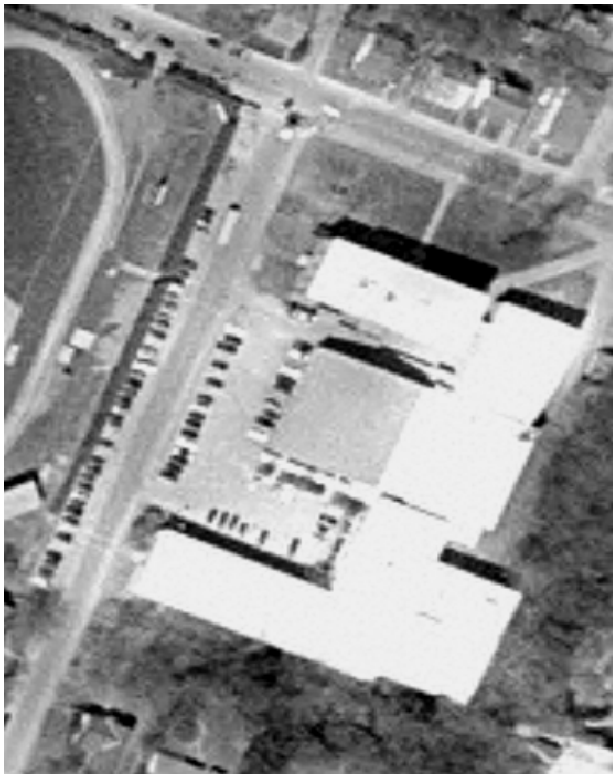
INDOOR AIR QUALITY ASSESSMENT

Southbridge High School
25 Cole Ave
Southbridge, Massachusetts



Prepared by:
Massachusetts Department of Public Health
Center for Environmental Health
Bureau of Environmental Health Assessment
Emergency Response/Indoor Air Quality Program
July 2004

Background/Introduction

At the request of a parent, the Massachusetts Department of Public Health (MDPH), Bureau of Environmental Health Assessment (BEHA) provided assistance and consultation regarding indoor air quality at the Southbridge High School (SHS), 25 Cole Avenue, Southbridge, MA. The request was prompted by concerns about mold resulting from humid weather experienced during the first three weeks of August 2003. The school was previously visited by Mike Feeney, Director of BEHA's Emergency Response/Indoor Air Quality (ER/IAQ) Program, in November of 1997. A report issued in 1997 described conditions of the building at that time and provided recommendations on correcting those problems (MDPH, 1997).

On February 11, 2004, a visit to evaluate potential mold problems and to conduct an indoor air quality reassessment was made to the SHS by Cory Holmes, Environmental Analyst in BEHA's ER/IAQ Program. The reassessment was primarily focused on mold. Mr. Holmes was accompanied for portions of the assessment by Michael Comeau, Maintenance Supervisor, and Charles Stuart, Business Manager, Southbridge Public Schools.

As part of the IAQ assessment/reassessment, the Southbridge School Department (SSD) provided BEHA staff with copies of reports, letters and memorandum related to the indoor air quality/mold concerns at the SHS. An indoor air quality study was conducted at the SHS by a consultant, Oasis Environmental Contracting Services, Inc. (Oasis), in August of 2003. This consultant recommended the following remedial actions.

- Disassemble and thoroughly clean all unit ventilators (univents) in impacted areas.
- Employ methods to control/reduce relative humidity and improved filtration of outside air.
- Consider installing univents equipped with air conditioning.

- Consider the operation of an air cleaner equipped with high efficiency particulate arrestance (HEPA) filtration and the use of dehumidifiers (Oasis, 2003).

The school department hired M & M Cleaning & Restoration (M&M), an environmental remediation firm, to perform microbial remediation/cleaning services as well as to develop and implement a mold remediation plan. M & M performed remedial activities from August 28, 2003 to September 2, 2003.

On October 14, 2003, Tighe & Bond (T&B), environmental consulting firm, also conducted an IAQ evaluation. The T&B report made the following recommendations.

- Clean the entire wing affected by mold growth (north side of first floor and entire second floor) with a HEPA filtered vacuum. Clean the SHS with a HEPA vacuum on a routine basis to control for dust and allergens.
- Remove, replace or seal the fiberglass insulation liner in univent interiors.
- Service all HVAC units and operate continuously to provide a minimum of 10 cubic feet per minute per occupant.
- Consider replacing filters with high efficiency pleated filters.
- Ensure that standing water in rooftop HVAC units drain properly (T&B, 2003).

Actions on Recommendations Previously Made by MDPH

As previously discussed, BEHA staff visited the building in November 1997 and issued a report that made recommendations to improve indoor air quality (MDPH, 1997). A summary of actions taken on previous recommendations is included as Appendix A of this reassessment.

Results

The school houses grades 9-12 with a student population of approximately 500 and a staff of approximately 100. The tests were taken during normal operations at the school. Test results appear in Table 1.

Discussion

Ventilation

It can be seen from Table 1 that carbon dioxide levels were above 800 parts per million of air (ppm) in fifteen of thirty-six areas evaluated, indicating inadequate ventilation in some of the areas surveyed. This was mainly due to a deactivation and/or obstruction of a number of mechanical ventilation components (i.e., univents were still being used as shelves in some areas similar to what was reported in 1997 by MDPH).

Fresh air in classrooms is supplied by a unit ventilator (univent) system (Picture 1). Univents draw air from outdoors through a fresh air intake located on the exterior walls of the building (Picture 2) and return air through an air intake located at the base of each unit (Figure 1). Fresh and return air are mixed, filtered, heated and provided to classrooms through an air diffuser located in the top of the unit. Univents had been deactivated in a number of classrooms surveyed (Table 1). Obstructions to airflow, such as books, papers and posters on top of univents, as well as bookcases, tables and desks in front of univent returns, were seen in a number of classrooms (Pictures 1 and 3). To function as designed, these units must be activated and allowed to operate during hours of school occupation. Importantly, univent air diffusers and return vents must remain free of obstructions.

Mechanical exhaust ventilation for the original building consists of wall-mounted exhaust vents that are connected by ductwork to rooftop motors. Air was either drawing weakly or not at all in a number of classrooms, which can indicate that exhaust vents were deactivated or that rooftop motors were not functioning. As with the univents, exhaust vents in several classrooms were blocked with books, carts, desks and other obstructions (Picture 4). In order to function properly, these vents must be activated and remain free of obstructions. Also limiting exhaust ventilation is the location of vents in some classrooms. Picture 5 shows the location of a classroom exhaust vent near the hallway door. When a classroom door is open, exhaust vents will tend to draw air from both the hallway and the classroom. The open hallway door reduces the effectiveness of the exhaust vent to remove common environmental pollutants from classrooms. Without proper exhaust ventilation, environmental pollutants can build up in the indoor environment and lead to indoor air quality complaints.

Mechanical ventilation in the 1976 addition is provided by a rooftop air handling unit (AHU) (Picture 6). Fresh air is distributed to classrooms via ceiling-mounted air diffusers. Airflow is controlled locally by a variable air volume (VAV) box. Each VAV box has a set of control dampers that open or close, depending on the temperature demand for a serviced area. The exhaust system in this part of the building is designed as an open ceiling plenum. School officials reported that the exhaust system was not functioning during the assessment.

To maximize air exchange, the BEHA recommends that both supply and exhaust ventilation operate continuously during periods of occupancy. In order to have proper ventilation with a mechanical ventilation system, the systems must be balanced subsequent to installation to provide an adequate amount of fresh air to the interior of a room while removing stale air from the room. It is recommended that HVAC systems be re-balanced every five years

to ensure adequate air systems function (SMACNA, 1994). These systems have not been balances since installation.

The Massachusetts Building Code requires that each room have a minimum ventilation rate of 15 cubic feet per minute (cfm) per occupant of fresh outside air or have openable windows (SBBRS, 1997; BOCA, 1993). The ventilation must be on at all times that the room is occupied. Providing adequate fresh air ventilation with open windows and maintaining the temperature in the comfort range during the cold weather season is impractical. Mechanical ventilation is usually required to provide adequate fresh air ventilation.

Carbon dioxide is not a problem in and of itself. It is used as an indicator of the adequacy of the fresh air ventilation. As carbon dioxide levels rise, it indicates that the ventilating system is malfunctioning or the design occupancy of the room is being exceeded. When this happens, a buildup of common indoor air pollutants can occur, leading to discomfort or health complaints. The Occupational Safety and Health Administration (OSHA) standard for carbon dioxide is 5,000 parts per million parts of air (ppm). Workers may be exposed to this level for 40 hours/week, based on a time-weighted average (OSHA, 1997).

The Department of Public Health uses a guideline of 800 ppm for publicly occupied buildings. A guideline of 600 ppm or less is preferred in schools due to the fact that the majority of occupants are young and considered to be a more sensitive population in the evaluation of environmental health status. Inadequate ventilation and/or elevated temperatures are major causes of complaints such as respiratory, eye, nose and throat irritation, lethargy and headaches. For more information concerning carbon dioxide, see Appendix B.

Temperature measurements ranged from 69^{o} F to 78^{o} F, which were very close to the BEHA recommended comfort range on the day of the assessment. The BEHA recommends that

indoor air temperatures be maintained in a range of 70° F to 78° F in order to provide for the comfort of building occupants. Building occupants expressed a variety of temperature control/comfort complaints (Table 1). In many cases concerning indoor air quality, fluctuations of temperature in occupied spaces are typically experienced, even in a building with an adequate fresh air supply. In addition, temperature control is difficult without the mechanical ventilation system functioning as designed (e.g., univents and exhaust vents deactivated/obstructed).

The relative humidity measured in the building ranged from 10 to 23 percent, which was below the BEHA recommended comfort range. The BEHA recommends a comfort range of 40 to 60 percent for indoor air relative humidity. Relative humidity levels in the building would be expected to drop during the winter months due to heating. The sensation of dryness and irritation is common in a low relative humidity environment. Low relative humidity is a very common problem during the heating season in the northeast part of the United States.

Microbial/Moisture Concerns

In the experience of BEHA staff, excessively humid weather can provide enough airborne water vapor to create adequate conditions for mold growth in buildings. Relative humidity in excess of 70 percent can provide an environment for mold and fungal growth (ASHRAE, 1989). In general, materials that are prone to mold growth can become colonized when moistened for more than 24 to 48 hours. Since hot, humid weather persisted in Massachusetts for more than 14 days during August 2003 (The Weather Underground, 2003), materials in many schools and buildings were moistened for an extended period of time. The US Environmental Protection Agency (US EPA) and the American Conference of Governmental Industrial Hygienists (ACGIH) recommends that porous materials be dried with fans and heating

within 24-48 hours of becoming wet (US EPA, 2001; ACGIH, 1989). If porous materials are not dried within this time frame, mold growth may occur. Water-damaged porous materials cannot be adequately cleaned to remove mold growth. The application of a mildewcide to moldy porous materials is not recommended.

As reported by school officials, mold growth occurred in SHS classrooms on the surface of porous items (e.g., books, papers, boxes) and non-porous items such as walls, chairs and tables following the humid weather experienced in August 2003. According to M&M, remediation efforts included disposal of all mold colonized items, cleaning of non-porous surfaces using HEPA filtered vacuum cleaners and wet wiping of many surfaces (M&M, 2003). No evidence of active mold growth or associated odors were detected by BEHA staff at the time of the reassessment. In addition to remediation work completed by the consultants, school department officials reported that the following measures were taken to prevent further water damage and/or mold growth:

- Trees and plants were trimmed back from the perimeter of the building to prevent water impingement and allow drying of building materials.
- Drainage improvements were made around the foundation.
- The apron on the rear of the building was paved to prevent water pooling (Picture 7).
- High efficiency pleated filters were installed in all univents (Picture 8).
- Relative humidity monitors and dehumidifiers were purchased for future use.

During the reassessment, BEHA staff noted the following conditions related to water penetration or damage within the SHS. Efflorescence (i.e., mineral deposits) and peeling paint was noted on walls in basement classroom C 008 (Picture 9). Efflorescence is a characteristic sign of water damage to building materials such as brick or plaster, but it is not mold growth. As moisture

penetrates and works its way through mortar around brick, water-soluble compounds in bricks and mortar dissolve, creating a solution. As the solution moves to the surface of the brick or mortar, water evaporates, leaving behind white, powdery mineral deposits.

A number of areas had water-stained ceiling tiles, which can indicate leaks from the roof or plumbing system (Picture 10). School officials reported active roof leaks in the vicinity of classrooms C 224-C 220 and in the library. At the time of the MDPH reassessment, school officials were working with a roofing contractor to make repairs. Water-damaged porous building materials can provide a source for mold and should be replaced after a water leak is discovered and repaired. Increasing the difficulty of replacing ceiling tiles is the suspended ceiling design. The system consists of a suspended ceiling of interlocking tiles, which requires the removal of a number of tiles. This design renders replacement of water-damaged tile difficult.

Exterior caulking around windows and frames was crumbling/damaged in a number of areas, indicating that the water seal is no longer intact (Pictures 11 and 12). The window in classroom 212 did not close properly and was taped shut (Picture 13). Replacement of caulking and repairs of window leaks are necessary to prevent drafts, water penetration and subsequent damage to building materials, which can lead to mold growth.

Other Concerns

Several other conditions that can affect indoor air quality were noted during the assessment. The art room (C 115) contains a flammable storage locker; however, a number of flammable materials were noted on top of the cabinet or on the floor (Picture 14). The flammable cabinet in the chemical storeroom near science room 200 also contained a flammable storage locker. This flammable cabinet was vented to the outside (Picture 15). The National

Fire Protection Association (NFPA) does not require venting in flammable storage cabinets. However, it is recommended that if a flammable storage cabinet is connected to a vent system, the vent system should not allow oxygen to penetrate the interior of the cabinet; the cabinet must also be vented directly outdoors and in a manner that does not compromise the specific performance of the cabinet (NFPA, 1996). It did not appear that this flammable cabinet had a mechanical exhaust fan in the ductwork or a damper to prevent backdrafting (Picture 16).

Several classrooms contained dry erase boards and dry erase board markers. Materials such as dry erase markers and dry erase board cleaners may contain volatile organic compounds (VOCs), such as methyl isobutyl ketone, n-butyl acetate and butyl-cellusolve (Sanford, 1999), which can be irritating to the eyes, nose and throat.

Also of note was the amount of materials stored inside classrooms. In a number of classrooms as in 1997, items were observed on windowsills, tabletops, counters, bookcases and desks. The large number of items stored in classrooms provides a source for dusts to accumulate. These items, (e.g., papers, folders, boxes) make it difficult for custodial staff to clean. Dust can be irritating to eyes, nose and respiratory tract. Items should be relocated and/or be cleaned periodically to avoid excessive dust build up. Accumulated dust and cobwebs were observed on flat surfaces and, in particular, along windowsills and radiator vents.

Finally, an excessive amount of wood dust was observed on flat surfaces in the wood shop. The instructor reported that the wood dust collection system was not functioning. Wood dust is a fine particulate, which can be easily aerosolized and can be irritating to the eyes, nose, throat and respiratory system. In addition, under certain conditions, wood dust is a fire hazard.

Conclusions/Recommendations

In view of the findings at the time of the visit, the following recommendations are made:

1. Operate both supply and exhaust ventilation continuously during periods of school occupancy, independent of classroom thermostat control, to maximize air exchange.
2. Remove all blockages from univents and exhaust vents to ensure adequate airflow.
3. Consult a ventilation engineer concerning re-balancing of the ventilation systems. Ventilation industrial standards recommend that mechanical ventilation systems be balanced every five years (SMACNA, 1994).
4. For buildings in New England, periods of low relative humidity during the winter are often unavoidable. Therefore, scrupulous cleaning practices should be adopted to minimize common indoor air contaminants whose irritant effects can be enhanced when the relative humidity is low. To control for dusts, a high efficiency particulate arrestance (HEPA) filter equipped vacuum cleaner in conjunction with wet wiping of all surfaces is recommended. Drinking water during the day can help ease some symptoms associated with a dry environment (e.g., throat and sinus irritations).
5. Consult "Mold Remediation in Schools and Commercial Buildings" published by the US Environmental Protection Agency (US EPA, 2001) for further information on mold. Copies of this document can be downloaded from the US EPA website at: http://www.epa.gov/iaq/molds/mold_remediation.html.
6. Examine the building envelope outside of basement classroom C 008 for signs of water penetration and make repairs.
7. Continue working with roofing contractor to eliminate roof leaks. Replace any water-damaged ceiling tiles, once leaks are repaired. Examine the area above and beneath these

areas for microbial growth. Disinfect areas of water leaks with an appropriate antimicrobial. Clean areas of antimicrobial application when dry.

8. Seal window frames and repair broken windows to prevent water penetration.
9. Repair/replace wood dust collection system in wood shop.
10. Determine if flammable cabinets are vented in a manner consistent with NFPA recommendations. If not, consider removing vent pipes and seal cabinet bung holes to render airtight.
11. Replace missing/dislodged ceiling tiles.
12. Relocate or consider reducing the amount of materials stored in classrooms to allow for more thorough cleaning. Clean items regularly with a wet cloth or sponge to prevent excessive dust build-up.
13. Consider adopting the US EPA document, "Tools for Schools" in order to maintain a good indoor air quality environment on the building. This document can be downloaded from the Internet at http://www.epa.gov/iaq/schools/index.html.
14. Refer to resource manuals and other related indoor air quality documents for further building-wide evaluations and advice on maintaining public buildings. These materials are located on the MDPH's website at http://www.state.ma.us/dph/beha/iaq/iaqhome.htm.

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Picture 1

Typical Univent, Note Art Objects Drying on Air Diffuser

Picture 2

Univent Fresh Air Intake

Picture 3

Classroom Univent Obstructed by Various Items

Picture 4

Classroom Exhaust Vent Obstructed by Bookcase and Plastic Bags

Picture 5

Location of Classroom Exhaust Vent and Hallway Door

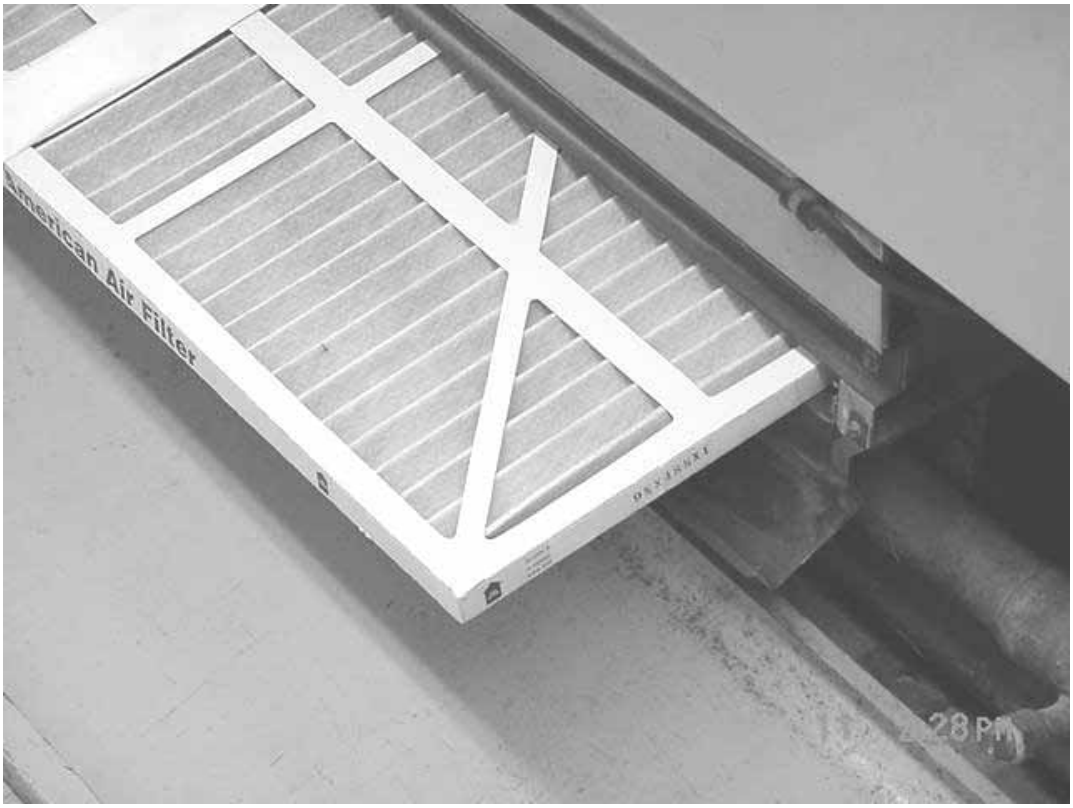
Picture 6

Rooftop AHU on 1976 Addition

Picture 7

Paved Area behind Southbridge High School

Picture 8



High Efficiency Pleated Filter in Univent

Picture 9

Peeling Paint and Efflorescence in Basement Classroom 008

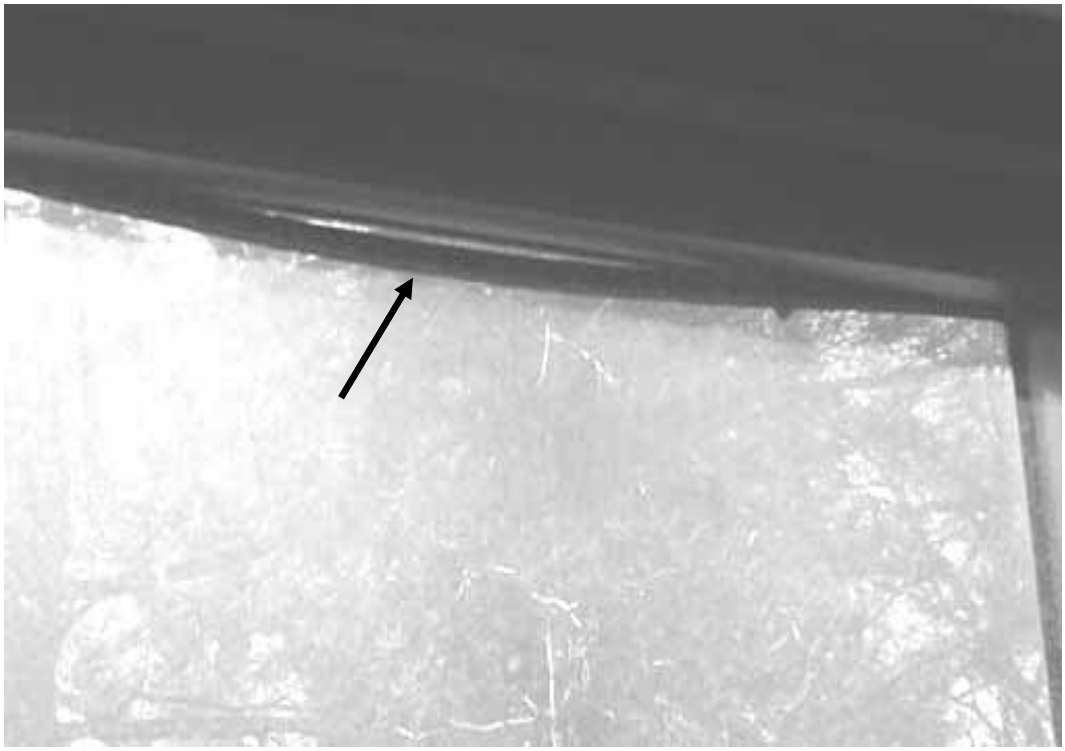
Picture 10

Water Damaged Interlocking Ceiling Tiles

Picture 11

Crumbling/Damaged Window Caulking

Picture 12



Loose/Failing Rubber Gasket around Window Pane

Picture 13

Window Duct-Taped Shut in Classroom 212

Picture 14

Flammable Materials on Floor of Art Room Next to Flame Cabinet

Picture 15

Flammable Cabinet Vented to Exterior Wall via Pipe

Picture 16

Exterior View of Vent Pipe, Note Absence of Motor or Baffle to Prevent Backflow

Building: Southbridge High School **Indoor Air Test Results**
Address: 25 Cole Ave, Southbridge, MA 01150 **TABLE 1** **Date: 02/11/04**

Location/Room	Occupants in Room	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (*ppm)	Windows Openable	Ventilation		Remarks
						Supply	Exhaust	
Background		46	18	360				Cloudy, Cold, NW winds 15-20 mph
Computer Room 100	10	71	20	646	N	Y	Y	PF, Cleaners, Clutter, Items on CT
M 114	11	72	23	977	N	Y	Y	2 WD-CT
Library	~40	72	20	586	N	Y	Y	Rooftop AHU
204	12	76	18	791	Y	Y	Y	Items on CT
201	20	75	17	741	N	N	N	Clutter, Items on CT, Plants
213	0	75	17	670	Y	Y	Y	
212	11	76	20	1052	Y	Y	Y	DEM, Damaged window (duct taped shut, Drafts
103	1	69	10	412	Y	Y	Y	Supply/Exhaust blocked by furniture
104	7	71	21	935	N	N	Y	Cleaners, UV off
101	0	71	17	590	N	Y	Y	3 MT/AT
M-4	18	73	20	865	N	Y	Y	Damaged/missing window caulking/gasket, 12 MT/AT

ppm = parts per million parts of air

AD = air deodorizer
AHU = air-handling unit
AP = air purifier
AC = air conditioning
CD = chalk dust
CT= ceiling tile
DEM = dry erase marker
DO = door open
MT= missing ceiling tile
PC = photocopier
PF = personal fan
TB = tennis balls
UF = upholstered furniture
WD = water damage
ND = non-detect

Comfort Guidelines

Carbon Dioxide -	< 600 ppm = preferred
	600 - 800 ppm = acceptable
	> 800 ppm = indicative of ventilation problems
Temperature -	70 - 78 °F
Relative Humidity -	40 - 60%

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						Supply	Exhaust	
107	7	74	16	765	Y	Y	Y	Supply blocked by boxes, Exhaust blocked by clutter/furniture, Plants
113	9	72	19	1001	Y	Y	Y	Clutter, exhaust – no draw
106	0	73	18	655	Y	Y	Y	Cleaners, Clutter, exhaust-no draw
108	13	72	18	902	Y	Y	Y	
105	19	72	21	1233	Y	Y	Y	Clutter, exhaust-no draw
M 217	9	76	17	733	Y	Y	Y	Stuffy, Poor airflow complaints, Heat complaints, Damaged/missing window caulking/gasket
Foreign Lang. Lab	10	75	17	724	N	Y	Y	AC well-MTD, DEM
214	15	78	21	1066	Y	Y	Y	
209	13	75	19	804	N	Y	Y	CTs in hallway 2nd floor
110	15	70	19	900	Y	Y	Y	Supply blocked by furniture, exhaust-no draw

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						Supply	Exhaust	
210	6	72	18	718	Y	Y	Y	
203	4	74	17	746	N	Y	Y	MT/AT
202	11	76	18	762	N	Y	Y	PF, Cobwebs-windows, Condensation-windows, Dust accumulated PF
200	10	75	18	795	Y	Y	Y	2 MT/AT, Plants, Temp extremes (hot & cold)
Chemical Storage								Flammable cabinet vented to outdoors – pipe (open/ no baffle)
C 221	10	73	20	882	Y	Y	Y	MT/AT, DEM, Supply blocked by furniture, exhaust-no draw
C 222	16	73	18	780	Y	Y	Y	exhaust-no draw
Nurse's Office	2	73	19	841	N	Y	Y	PF, 2 WD-CT
C 218	11	73	19	859	Y	N	Y	PC, PF, exhaust-no draw
C 115 (Art Rm)	2	78	18	675	N	Y	Y	4 MT/AT, Dust, Clutter, UV noise (rattling), Pottery, Flam. mats on top of flam. locker on floor, exhaust-no draw

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						Supply	Exhaust	
C 117 (Cooking)	8	73	17	636	N	Y	N	PF, No exhaust, Room divided
C 224	10	73	18	965	Y	Y	Y	14 WD-CT, exhaust-no draw
C 220	6	70	18	970	Y	Y	Y	UV noise (squeak), Occupants gone 1 minute, exhaust-no draw
Sewing	0	73	17	611	N	Y	Y	Rec. ducting exhaust into cooking room
Wood Shop	7	72	18	669	N	Y	Y	Wood dust flat surf, Collection system not functioning
C 008	10	71	18	782	Y	Y	Y	Water infiltration corner foundation, Rattling UV, Efflorescence & Peeling paint, 4 WD-CT, exhaust-no draw

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Appendix A

Actions on MDPH Recommendations, Southbridge High School, Southbridge, MA

The following is a status report of action(s) taken on MDPH recommendations (**in bold**) based on reports from town officials, school maintenance staff, documents, photographs and MDPH, BEHA staff observations.

1. **In order to improve indoor air quality, an increase in the percentage of fresh air supply into the univent system may be necessary. Preventing access to univent controls may be a necessary step to make sure these systems cannot be turned off. Prevent the use of univents as book shelving/storage areas in order to have this system function properly.**

   Action: School officials reported that the univents were surveyed, checked and found in good working order, however BEHA staff found univents were still found deactivated in a number of areas and used as shelving.

2. **Evaluate the exhaust system for function and repair. Prevent obstruction of exhaust vents in univent serviced rooms.**

   Action: School officials reported that exhaust systems were evaluated and school staff were advised to not obstruct exhaust vents, however BEHA staff found some exhaust vents were not drawing air or were obstructed.

3. **In rooms serviced by VAV boxes, repair this equipment. If this equipment cannot be repaired, consider replacing the VAV boxes. Consider consulting a ventilation engineering firm to examine whether the VAV boxes should be repaired or replaced.**

Appendix A

Action: Town officials reported that a survey to evaluate the mechanical ventilation system was conducted by a ventilation engineering firm, whose report was not received by date of this assessment.

4. **Examine the function of the open, plenum exhaust system to see if its efficiency can be improved.**

   Action: See Action 3.

5. **Once both the fresh air supply and the exhaust ventilation are functioning in all areas of the building, the ventilation needs to be balanced.**

   Action: Southbridge Public School Officials reported that the system has not been balanced since installation despite BEHA recommendations.

6. **Replace any remaining water stained ceiling tiles. Examine the area above these tiles for continuing water leaks and repair. Examine all water damaged materials for mold growth. Disinfect areas of water leaks with an appropriate antimicrobial. If material is porous, discard and replace.**

   Action: School department officials reported that ceiling tile replacement is an on-going project, however BEHA staff identified a number of areas with water damaged ceiling tiles during this assessment.

7. **Examine the area above ceiling tiles for friable asbestos. If asbestos is present and not encapsulated, consult an asbestos remediation consultant to assess the condition of the asbestos and remove in accordance with Massachusetts statutes and regulations.**

   Action: School officials reported that they are in compliance with the Asbestos Hazard Emergency Response Act (AHERA), which requires inspection of asbestos

containing materials every three years. AHERA requires public and private non-profit primary and secondary schools to inspect their buildings for asbestos-containing building materials. The Environmental Protection Agency (EPA) has published regulations that require schools subject to AHERA to:

- Perform an original inspection and periodic re-inspections every 3 years for asbestos containing material
- Develop, maintain, and update an asbestos management plan and keep a copy at the school
- Provide yearly notification to parent, teacher, and employee organizations regarding the availability of the school's asbestos management plan and any asbestos abatement actions taken or planned in the school (EPA, 1986)

8. **In order to prevent wood shop odors from penetrating into other parts of the school, keep wood shop door closed. Install an automatic door closing device if necessary. The shop has a paint-drying room. Conduct necessary repairs to the local exhaust system of this paint-drying room and use accordingly. Do not store wood stain soaked paper in trash barrels, store in a fire code approved waste container.**

Action: The wood shop door was shut and no odors were detected outside the wood shop by BEHA staff. Southbridge Public School Officials reported that the paint drying room is no longer in use. No wood stained soaked paper was observed

in trash barrels. Conditions noted in the main body of the report did not impact either classrooms or the stairwell described in the BEHA 1997 IAQ assessment.

9. **Use bathroom cleaning materials after hours to prevent chemical odors in occupied sections of the school. Consider replacing mop treatment with an odorless, water based product which should decrease odors in classrooms.**

   Action: School department officials reported that these activities are conducted after hours to prevent odors during school occupation.

10. **Connect the kiln to the local exhaust fan with ducting. Do not run kiln during school hours with students present in the room.**

    Action: The kiln was not ducted. However, the art staff has been instructed to operate the kiln after school hours in conjunction with the local exhaust fan mounted on the exterior wall.

11. **Continue to do a chemical inventory in the school. Properly store flammable materials in a manner consistent with the local fire code. Discard old hazardous materials or empty containers of hazardous materials in a manner consistent with environmental statutes and regulations.**

    Action: All material safety data sheets (MSDS) are reportedly located on-site in the custodial office.